

CLAIMS

1. An apparatus of supplying and containing a micro-plate, comprising:

a first stock portion, including:

a first support member, supporting a plurality of micro-plates in a stacked state from a lower side; and

a support release mechanism, changing the first support member into a state of not supporting the micro-plates;

a second stock portion, including a long vertical length arranged on a lower side of the first stock portion in series in an up and down direction;

a second support member, supporting the plurality of micro-plates in the stacked state from a lower side at an inner portion of the second stock portion;

a moving up and down mechanism, moving up and down the second support member;

a micro-plate carrying unit, carrying the micro-plate disposed at a micro-plate carry out level set at the second stock portion to outside and mounting the micro-plate to the second support member from the outside;

a micro-plate supplying operation processing unit, making the support release mechanism and the moving up and down mechanism execute an operation of moving up the second support member and lifting the micro-plates in the stacked state supported by the first support member by the second support

member to switch to mount on the second support member, thereafter, changing the first support member into a state of not supporting the micro-plates, thereafter, moving down the second support member and moving the plurality of micro-plates in the stacked state to the second stock portion, and disposing a micro-plate at a uppermost stage in the stacked state to the micro-plate carry out level by controlling a height position of the second support member; and

a micro-plate containing operation processing unit, making the moving up and down mechanism execute an operation of moving up the second support member mounted with the micro-plate delivered by the micro-plate carrying unit to a height of capable of supporting the micro-plate by the first support member and thereafter, supporting the micro-plate by the first support member by moving down the second support member.

2. The apparatus of supplying and containing a micro-plate according to Claim 1, wherein the micro-plate carrying unit comprises:

a grasping mechanism for pressing a grasping member to a side face of the micro-plate at the uppermost stage disposed at the micro-plate carry out level to grasp;

a micro-plate separating unit, separating the micro-plate at the uppermost stage from the micro-plate at a

successive stage by moving the second support member and the grasping member grasping the micro-plate relative to each other in the up and down direction; and

a micro-plate carrying out unit for carrying out the micro-plate at the uppermost stage separated by the micro-plate separating unit.

3. The apparatus of supplying and containing a micro-plate according to Claim 1, further comprising:

an upper face detecting unit, detecting an upper face of the micro-plate at the uppermost stage in the plurality of micro-plates supported by the second support member in the stacked state;

wherein the micro-plate supplying operation processing unit disposes the micro-plate at the uppermost stage to the micro-plate carry out level by controlling the moving up and down mechanism by constituting a reference by the height position of the second support member when the upper face detecting unit detects the upper face of the micro-plate.

4. The apparatus of supplying and containing the micro-plate according to Claim 3, wherein the upper face detecting unit is contact type detecting unit having a contactor brought into contact with the upper face of the micro-plate.

5. The apparatus of supplying and containing a micro-plate according to Claim 4, wherein the contact type detecting unit includes:

a sensor, detecting that the contactor is moved to be brought into contact with the upper face of the micro-plate.

6. The apparatus of supplying and containing a micro-plate according to Claim 2, wherein the micro-plate carrying out unit includes:

a support table, supporting the micro-plate at the uppermost stage by advancing to between the micro-plate at the uppermost stage and the micro-plate at the successive stage separated by the separating unit.

7. The apparatus of supplying and containing a micro-plate according to Claim 2, wherein the micro-plate separating unit is a grasping member moving up and down mechanism for moving up and down the grasping member.

8. The apparatus of supplying and containing a micro-plate according to Claim 3, further comprising:

a fixing mechanism, temporarily fixing the micro-plate at the successive stage when the micro-plate at the uppermost stage is separated.

9. The apparatus of supplying and containing a micro-plate according to Claim 2, wherein the micro-plate carrying out unit is provided with the grasping mechanism.

10. The apparatus of supplying and containing a micro-plate according to Claim 9, wherein the micro-plate separating unit is a grasping portion moving up and down mechanism for moving up and down the grasping mechanism and the grasping member moving up and down mechanism is provided to the micro-plate carrying unit.

11. The apparatus of supplying and containing a micro-plate according to Claim 10, further comprising:

a fixing mechanism, temporarily fixing the micro-plate at the successive stage when the micro-plate at the uppermost stage is separated.

12. A method of supplying a micro-plate characterized in a method of supplying a micro-plate in an apparatus of supplying and containing a micro-plate comprising a first stock portion including a first support member for supporting a plurality of micro-plates in a stacked state from a lower side and a support release mechanism for changing the first support member into a state of not supporting the micro-plates, a second stock portion having a long vertical length arranged on a lower side

of the first stock portion in series in an up and down direction, a second support member for supporting the plurality of micro-plates in the stacked state from a lower side at an inner portion of the second stock portion, a moving up and down mechanism for moving up and down mechanism for moving up and down the second support member, and micro-plate carrying unit for carrying the micro-plate disposed at a micro-plate carry out level set at the second stock portion to outside and mounting the micro-plate to the second support member from the outside, said method comprising the steps of:

moving up the second support member and lifting the micro-plates in the stacked state supported by the first support member by the second support member to switch to mount on the second support member;

changing the first support member into a state of not supporting the micro-plates by operating the support release mechanism;

moving down the second support member and moving the micro-plates in the stacked state which have been switched to mount on the second support member to the second stock portion;

disposing the micro-plate at a uppermost stage in the stacked state to the micro-plate carry out level by controlling a height position of the second support member; and

carrying out the micro-plate disposed at the micro-plate carry out level to the outside by the micro-plate carrying unit.

13. The method of supplying a micro-plate according to Claim 12, further comprising the steps of:

detecting an upper face of the micro-plate at the uppermost stage by upper face detecting unit after switching the plurality of micro-plates in the stacked state to mount on the second support member;

wherein the micro-plate at the uppermost stage is disposed to the micro-plate carry out level by controlling the moving up and down mechanism by constituting a reference by a height position of the second support member when the upper face of the micro-plate is detected by the upper face detecting unit.

14. A method of containing a micro-plate characterized in a method of containing a micro-plate in an apparatus of supplying and containing a micro-plate comprising a first stock portion including a first support member for supporting a plurality of micro-plates in a stacked state from a lower side and a support release mechanism for changing the first support member into a state of not supporting the micro-plates, a second stock portion having a long vertical length arranged on a lower side of the first stock portion in series in an up and down direction, a second support member for supporting the plurality of micro-plates in the stacked state from a lower side at an inner portion of the second stock portion, a moving up and down

mechanism for moving up and down the second support member, and micro-plate carrying unit for carrying the micro-plate disposed at a micro-plate carry out level of the second stock portion to outside and mounting the micro-plate to the second support member from the outside, said method comprising the steps of:

mounting the micro-plate to the second support member by the micro-plate carrying unit; and

moving down the second support member mounted with the micro-plate delivered by the micro-plate carrying unit to a height of capable of supporting the micro-plate by the first support member and thereafter supporting the micro-plate by the first support member by moving down the second support member.

15. An apparatus of processing a micro-plate characterized in comprising a first apparatus of supplying and containing a micro-plate capable of containing a plurality of micro-plates in a stacked state, a second apparatus of supplying and containing a micro-plate capable of containing a plurality of micro-plate in a stacked state, a working unit for executing a predetermined processing operation for the micro-plates, and a micro-plate carrying mechanism for carrying the micro-plates from the first apparatus of supplying and containing the micro-plate to the second apparatus of containing and supplying the micro-plate via the working unit, or carrying the micro-plates from the second apparatus of supplying and

containing the micro-plate to the first apparatus of supplying and containing the micro-plate via the working unit;

wherein the first apparatus of supplying and containing the micro-plate and the second apparatus of supplying and containing the micro-plate each comprises:

a first stock portion, including:

a first support member for supporting a plurality of micro-plates in a stacked state from a lower side; and

a support release mechanism for changing the first support member into a state of not supporting the micro-plates;

a second stock portion, having a long vertical length arranged on a lower side of the first stock portion in series in an up and down direction;

a second support member, supporting the plurality of micro-plates in the stacked state from a lower side at an inner portion of the second stock portion;

a moving up and down mechanism, moving up and down the second support member;

a micro-plate carrying unit, carrying the micro-plate disposed at a micro-plate carry out level set at the second stock portion to outside and mounting the micro-plate to the second support member from the outside;

a micro-plate supplying operation processing unit, making the support release mechanism and the moving up and down mechanism execute an operation of moving up the second support

member and lifting the micro-plates in the stacked state supported by the first support member by the second support member to switch to mount on the second support member, thereafter, changing the first support member into a state of not supporting the micro-plates, thereafter, moving down the second support member and moving the plurality of micro-plates in the stacked state to the second stock portion, and disposing the micro-plate at a uppermost stage in the stacked state to the micropalte carry out level by controlling a height position of the second support member; and

a micro-plate containing operation processing unit, making the moving up and down mechanism execute an operation of moving up the second support member mounted with the micro-plate delivered by the micro-plate carrying unit to a height of capable of supporting the micro-plate by the first support member and thereafter, supporting the micro-plate by the first supportmember by moving down the second support member.